

CLAIMS

1. A surface acoustic wave device comprising:
 - a substrate;
 - a plurality of terminals disposed on the substrate and containing at least an unbalanced terminal and two balanced terminals; and
 - at least one surface acoustic wave element disposed between the unbalanced terminal and the balanced terminals on the substrate, wherein different signal lines connected to the same surface acoustic wave element intersect through an insulating film.
2. A surface acoustic wave device as claimed in claim 1, wherein the insulating film is polyimide.
3. A surface acoustic wave device as claimed in claim 1 or 2, wherein at least two of the surface acoustic wave elements are contained,
 - wherein one of the two surface acoustic wave elements (hereinafter, referred to as a first element) is connected to the unbalanced terminal and a ground terminal (hereinafter, referred to as a ground pad) for grounding with the different signal lines,
 - wherein at least two of the signal line (hereinafter, referred to as a signal wiring for connecting the other of the two surface acoustic wave elements (hereinafter, referred to as a second element) and the first element are formed,
 - wherein at least one of the signal wiring and the signal line (hereinafter, referred to as a ground wiring) for connecting the ground pad and the first element intersect through the insulating film, and
 - wherein the ground pad is disposed outside an area enclosed by the first element, the second element, and the signal wirings.
4. A surface acoustic wave device as claimed in claim 3, wherein the first element contains three IDTs disposed so as to

have the same propagation direction of a surface acoustic wave, and the unbalanced terminal and the ground pad are connected to the middle IDT,

wherein the second element contains three IDTs disposed so as to have the same propagation direction of a surface acoustic wave, and two balanced terminals are connected to the middle IDT, and

wherein the IDTs on either side of the first element and the IDTs on either side of the second element are connected by the signal wirings.

5. A surface acoustic wave device as claimed in claim 3,

wherein two sets of the first element, the signal wirings, and the second element are formed on the substrate,

wherein the first element of each set contains three IDTs disposed so as to have the same propagation direction of a surface acoustic wave, and the unbalanced terminal and the ground pad are connected to the middle IDT,

wherein the second element of each set contains one IDT connected to one of the balanced terminals different from that in the other sets,

wherein, in each set, the two signal wirings connect the IDTs on either side of the first element and the IDT of the second element, and

wherein the first elements of the two sets are in opposite phase to each other.

6. A surface acoustic wave device as claimed in any one of claims 3 to 5,

wherein the ground wiring contains a first layer formed excluding the insulating film and its vicinity and a second layer formed including the insulating film and its vicinity.

7. A surface acoustic wave device as claimed in claim 1 or 2,

wherein at least two surface acoustic wave elements connected to each other are contained,

wherein one of the two surface acoustic wave elements (hereinafter, referred to as a first surface acoustic wave element) is a longitudinal coupling resonator-type surface acoustic wave element having three IDTs disposed along the propagation direction of a surface acoustic wave, and the middle IDT out of the three IDTs is connected to the two balanced signal terminals through the two signal lines (hereinafter, referred to as first and second signal lines),

wherein the two balanced signal terminals are disposed on either side of the central axis of the substrate substantially in parallel to the direction in which the two surface acoustic wave elements are arranged, and

wherein at least one of the first and second signal lines is disposed on the insulating film formed on the substrate.

8. A surface acoustic wave device as claimed in claim 7,

wherein the two balanced signal terminals are disposed so as to be substantially symmetrical around the central axis of the substrate.

9. A surface acoustic wave device as claimed in claim 7 or 8,

wherein the second surface acoustic wave element is disposed in the propagation direction of a surface acoustic wave and is a longitudinal coupling resonator-type surface acoustic wave filter element having three IDTs cascade-connected to the first surface acoustic wave element.

10. A surface acoustic wave device as claimed in claim 7 or 8,

wherein the second surface acoustic wave element is one or a plurality of surface acoustic wave resonator elements connected together.

11. A surface acoustic wave device as claimed in claim 1 or 2,

wherein the surface acoustic wave element is a longitudinal coupling resonator-type surface acoustic wave filter element containing three IDTs disposed along the propagation direction of a surface acoustic wave, and the middle IDT out of the three IDTs is

connected to the two balanced terminals through the signal lines (hereinafter, referred to as first and second signal lines),

wherein the balanced signal terminals are disposed on both sides of the central axis of the substrate substantially perpendicular to the propagation direction of a surface acoustic wave, and

wherein at least one of the first and second signal lines is disposed on the insulating film formed on the substrate.